



### Short Communication

## Zooplankton Composition in Dahanu Creek-West Coast of India

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### Abstract

The distribution and faunistic composition of zooplankton was studied during November 2008 and October 2009 from Dahanu creek- west coast of India. Geographical location of Dahanu is 19° 58' N and 72° 44'E. Total 21 group of zooplankton were observed during the study period. Maximum species diversity was observed at station 1 (in open sea) and minimum at station 5 (in creek). Zooplankton biomass varied from 65.40 to 120.80 ml .100 m<sup>-3</sup> (average 80.94 ml. 100 m<sup>-3</sup>) in the outer creek and 12.50 to 64.30 ml.100 m<sup>-3</sup> ( average 29.62 ml. 100 m<sup>-3</sup>) in the inner creek area . Zooplankton biomass was highest in October at all stations however low biomass was recorded in July when the salinity decreased considerably. The dry weight of zooplankton ranged from 3.965 to 11.830 gr.100 m<sup>-3</sup> (average 7.496 gr.100 m<sup>-3</sup>) in outer creek and 1.280 to 5.932 gr.100 m<sup>-3</sup> (average 3.005 gr.100 m<sup>-3</sup>) in inner creek area .The dry wet of zooplankton was maximum in October at all the stations and was minimum in July. Copepods, decapod larvae, egg mass, fish eggs, fish larvae, polychaete larvae, hydrozoans, tintinnids and chethognaths formed dominant groups of total zooplankton population.

**Key words:** Dahanu creek, zooplankton biomass, composition.

### Introduction

Zooplankton is the myriads of floating and drifting animals with limited or no power of locomotion. It includes protozoan, jelly fishes, chaetognaths, worms, small crustaceans, egg and larvae of benthos and nekton. Majority of them feed on phytoplankton and facilitate the conservation of plant material into the animal tissue and in turn constitute the basic food for higher animals .Their occurrence and distribution influence pelagic fishery potentials (Zooplankton identification manual of National Institute of Oceanography – Goa). The zooplanktons are more varied as compared to phytoplankton their variability in any aquatic ecosystem is influenced majority by patchiness, diurnal vertical migration and season<sup>1</sup>. Zooplankton forms an important link in the marine food chain as secondary producers. They play an important role in the conservation of energy from primary to secondary level<sup>2</sup>. Zooplankton is an important component of the pelagic community since it includes the major consumers of primary production. It plays an active role in the modification and remineralization of the particulate organic matter in the water column<sup>3</sup>.

This paper briefly describes the zooplankton distribution of the Dahanu creek along the west coast of India and elaborates the decapods and copepod species composition.

### Material and Methods

Zooplankton was sampled from November 2008 to October 2009 in Dahanu creek (19° 58' N and 72° 44'E).Total five stations were selected for collection of zooplankton, three

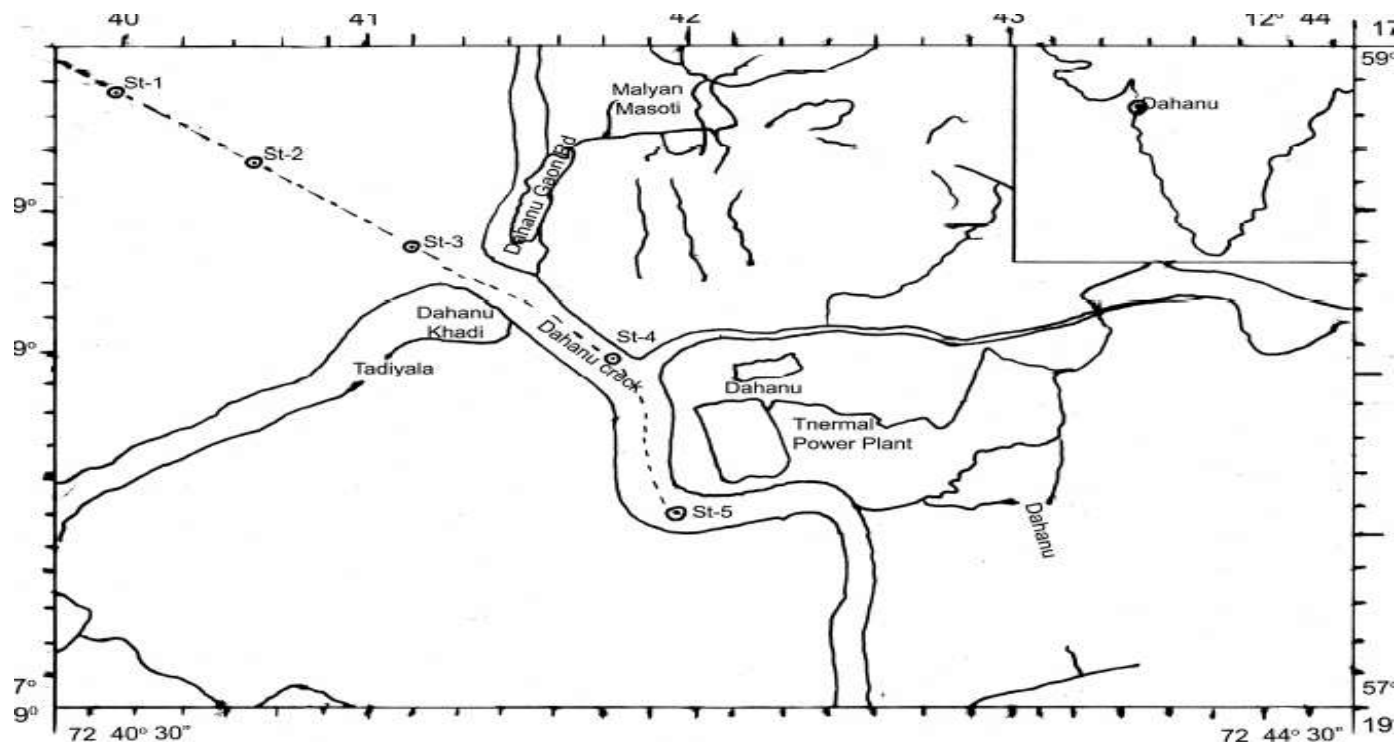
stations were in the open sea and two stations were in the creek. These stations covered an area of 20 km long and the depth varied from 5 to 26.5 meters (figure 1).

The study period lasted for 15 months. During this period, total 65 samples were collected for qualitative and quantitative evaluation of zooplankton. Zooplankton samples were collected by using H.T. net mesh size 0.3 µm and the collected zooplankton samples were kept in 500 ml wide mouth plastic bottles having 4% formalin. The wet weight of the zooplankton was determined after washing the zooplankton with distilled water and thereafter filtering through filter paper.

The dry weight of zooplankton was determined by drying the filtered samples in a hot air oven at 70°C till constant weight. The results were calculated as mg m<sup>-3</sup> of sea water.

Zooplankton volume was measured by displacement method, in this method zooplankton were filtered and blotted with filter paper and mass was transferred to measuring cylinder having known volume of 4% formalin prepared in sea water. The rise in level of sea water in measuring cylinder was recorded. The difference between final and initial reading gave volume of zooplankton. The results were expressed as ml m<sup>-3</sup>. Zooplankton analysis was done using standard methods<sup>4 and 5</sup>.

For identification of zooplankton published research paper were followed<sup>6-12</sup>.



**Figure -1**  
**Location of sampling stations**

## Results and Discussion

Dahanu creek is fully rich with zooplankton community because about 20 to 30 tones marine fishes captured by local fishermen per year (Fish production report 2006-08). The important landings are Bombay duck, pomfrets, sienids, elasmobranchs, lobsters and prawns etc. Biotic features of Dahanu creek were influenced by the tides and monsoon. Total 21 groups of zooplankton were observed during the study period including copepods, decapods, eggmass, fish eggs, fish larvae, polychaet larvae, hydrozoans, tintinnids, chaetognaths, pyrosomids, isopods, amphipods, mysids, medusae, foraminiferans, gastropods, siphonophores, ctenophores, lucifer, cladoceras, bivalves, hydrozoans, ostracods, euphausiids and echinoderms (table 1).

Copepods, decapods, tintinnids, chaetognaths, fish eggs and fish larvae were observed at all the stations. Amphipods and euphausiids were observed only at station 1. In addition to this echinoderms and ostracods were observed at station 3. The minimum number of group (13) during the study period was observed at station 5 where as maximum group (19) at station 1. Zooplankton biomass was highest in October at all stations however low biomass was recorded in July when the salinity decreased considerably. Copepods usually maximum in number except July at station 1 and 3 when decapod larvae occurred in higher numbers. Zooplankton biomass ranged from 65.40 to 120.80 ml .100 m<sup>-3</sup> (average 80.94 ml. 100 m<sup>-3</sup>) in the outer creek and 12.50 to 64.30 ml.100 m<sup>-3</sup> ( average 29.62 ml. 100 m<sup>-3</sup>) in the inner creek area (Table 2).

The dry weight of zooplankton ranged from 3.965 gr.100 m<sup>-3</sup> to 11.830 gr.100 m<sup>-3</sup> (average 6.92 gr.100 m<sup>-3</sup>) in outer creek and 1.280 to 5.932 gr.100 m<sup>-3</sup> (average). The dry wet of zooplankton was maximum in October at all the stations and was minimum in July (table 3).

The minimum fresh weights, dry weight, volume of zooplankton were observed in July at station 5 that was in the creek. This was probably due to presence of suspended solids in sea water. The high productivity in terms of fresh weight, dry weight and volume of zooplankton was observed at station 1 in October. Total population of zooplankton in the outer creek area was varied from 475350 to 1182160 (no.100<sup>-3</sup>) and inner creek was 125760 to 678640 (no.100<sup>-3</sup>) table-3. Copepods were more abundant in all zooplankton community both in open sea and creek, copepod species including *Eucalanus sp.*, *Paracalanus sp.*, *Euchaeta sp.*, *Centropages sp.*, *Lucicutia sp.*, *Pontella sp.*, *Pleuromamma sp.* were present in zooplankton collection. The second largest group in zooplankton community was decapod larvae including Zoea and *Brachvura*.

Most marine animal-phyta from poriferans to chordates are represented in the plankton, many species are holoplanktonic i.e. they live permanently in the pelagic habitat. The study of marine zooplankton ecology demands considerable efforts from scientific and technological standpoint<sup>13</sup>.

**Table -1**  
**Monthly variation in zooplankton total population (no.100<sup>-3</sup>) and dominant groups at 5 different stations of Dahanu creek west coast of India**

Months	Outer creek			Inner creek		Dominant groups
	Station 1	Station 2	Station 3	Station 4	Station 5	
Nov.08	690430	766780	475350	125760	622870	Cope,deca,chaet, Tin,poly,hydro, F and L
Dec.08	908200	795130	985340	324850	140580	Cope,deca,chaet, Tin,poly,hydro,F and L
Jan.09	983270	690840	923420	177440	126780	Cope,deca,chaet, Tin,poly,hydro,F & L
Feb.09	805430	1084320	634280	178650	252240	Cope,deca,chaet, Tin,poly,hydro,F & L
Mar.09	774520	927230	698050	126930	678640	Cope,deca,chaet, Tin,poly,hydro,F & L
Apr.09	704360	838270	892650	325450	387460	Cope,deca,chaet, Tin,poly,hydro,F & L
May 09	698420	523470	865090	568780	496510	Cope,deca,chaet, Tin,poly,hydro,F & L
June 09	1034280	949830	732090	318750	237640	Cope,deca,chaet, Tin,poly,hydro,F & L
July 09	684220	498060	423170	304520	166430	Deca,cope,chaet,poly,tin,F&L
Aug.09	824560	597640	889660	854200	316590	Cope,deca,chaet, Tin,poly,hydro,F & L
Sep.09	657120	876350	598760	597620	154360	Cope,deca,chaet, Tin,poly,hydro,F & L
Oct.09	1182160	1036570	889750	342180	453270	Cope,deca,chaet, Tin,poly,hydro,F & L

Cope = Copepods,Deca = Decapods, Chaet = chaetognaths, Tin = tintinnids, Hydro = Hydrozoans, Poly = Polychaet larvae , F & L = Fish eggs/larvae.

**Table – 2**  
**Monthly variation in zooplankton biomass (ml.100<sup>-3</sup>) at 5 different stations of Dahanu creek west coast of India**

Months	Outer creek			Inner creek	
	Station 1	Station 2	Station 3	Station 4	Station 5
Nov.08	65.5	74.00	43.00	12.5	36.00
Dec. 08	52.20	80.00	92.50	24.80	26.00
Jan.09	90.50	68.20	91.50	24.00	14.50
Feb.09	84.00	108.00	62.00	19.00	37.20
Mar.09	78.20	90.50	74.80	14.00	64.30
Apr.09	68.50	84.20	89.20	30.50	40.00
May 09	70.80	60.80	88.00	60.80	52.20
June 09	105.20	90.00	72.80	34.30	24.20
July 09	76.50	52.80	45.20	32.00	19.50
Aug.09	86.20	66.50	92.50	16.00	32.80
Sep.09	67.50	88.50	67.00	20.00	16.20
Oct.09	120.80	106.50	94.00	36.80	42.50

**Table – 3**  
**Monthly variation in zooplankton dry weight (gr.100<sup>-3</sup>) at 5 different stations of Dahanu creek west coast of India**

Months	Outer creek			Inner creek	
	Station 1	Station 2	Station 3	Station 4	Station 5
Nov.08	6.360	7.856	4.342	1.280	3.540
Dec. 08	4.960	7.540	8.867	2.760	2.132
Jan.09	8.563	5.628	9.108	2.652	1.312
Feb.09	7.950	9.850	5.756	2.432	2.920
Mar.09	6.890	8.754	6.976	1.876	5.932
Apr.09	6.420	7.853	8.123	3.912	3.866
May 09	6.872	5.673	8.543	5.442	4.929
June 09	9.960	8.950	7.543	2.991	2.902
July 09	7.240	4.865	3.965	2.862	2.231
Aug.09	8.230	5.660	8.975	1.992	2.950
Sep.09	5.967	7.960	5.876	2.120	1.820
Oct.09	11.830	10.540	9.542	3.432	3.923

## Conclusion

The present investigation suggests that Dahahu creek is fully rich with zooplankton and supported a diverse community. The zooplankton species which occur during the high saline period tolerate wide salinity fluctuations. The present baseline information on the zooplankton is useful for preparing data sheet on fish production report of Dahanu area. The present report on zooplankton provides the baseline information for future ecological assessment and monitoring of the Dahanu coastal area.

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